RAEM1 Introduction

RAEM1 system is a complete full function IoT-AE system designed for remote unattended acoustic wave (acoustic emission) long term non-destructive testing and condition monitoring applications. RAEM1 is a single channel AE monitoring system integrated with AE sensor, data acquisition, processing and transmission modules in one small cylinder.

Working Principle

The AE sensor converts the acoustic waves signal of material into electrical signals through piezoelectric effect, and the built-in preamplifier amplifies the electrical signals from the sensor to increase the signal-to-noise ratio of the signal to facilitate signal transmission to RAEM1 via a coax cable. The RAEM1 performs A/D conversion, processing and analysis of the signal, and then transmit the result data to computer/cloud/servers via wired or wireless communication methods.

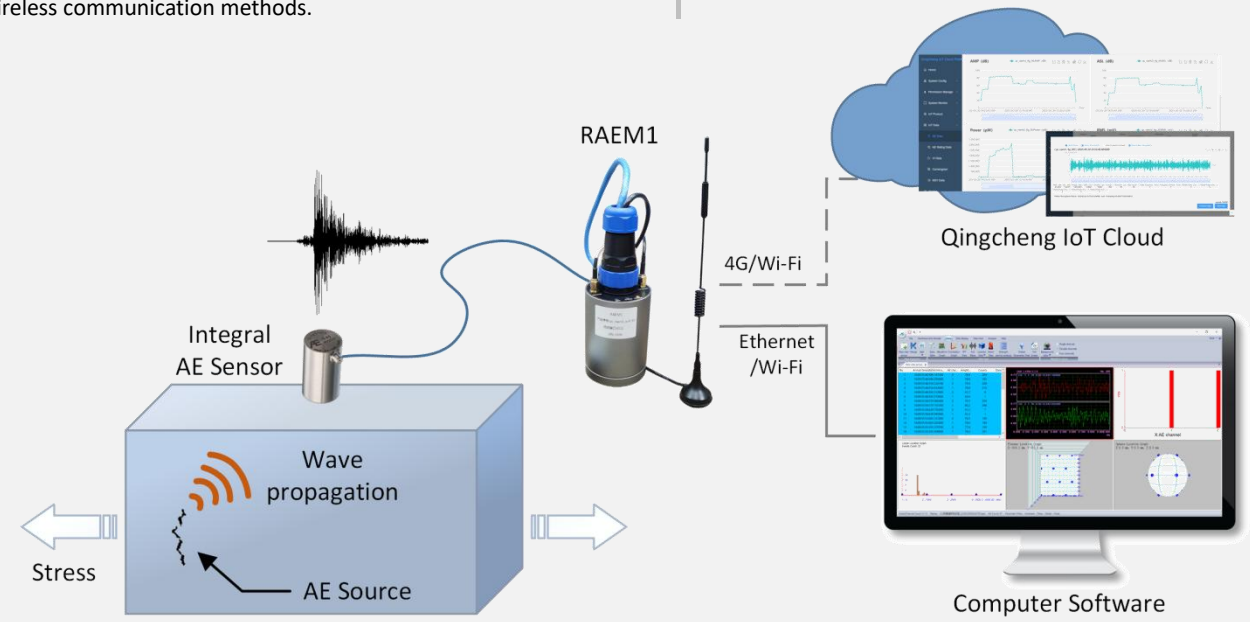
Features

- Single channel system, flexible installation
- Wired and wireless communication
- Real-time automatic acquisition and transmission
- Threshold or time triggering

Applications

RAEM1 can real-time monitor cracking, corrosion, leakage, wears, lubrication and other failures or defects in the early stage to predict and alarm early fault detection and maintenance. The typical applications are:

- Bridge wire break monitoring
- Rotating machine condition monitoring
- Structural health monitoring
- Valve leak monitoring
- Welding crack monitoring
- Bolts tightness monitoring
- Cutting tool condition monitoring



RAEM1 Work Principle and System Diagram

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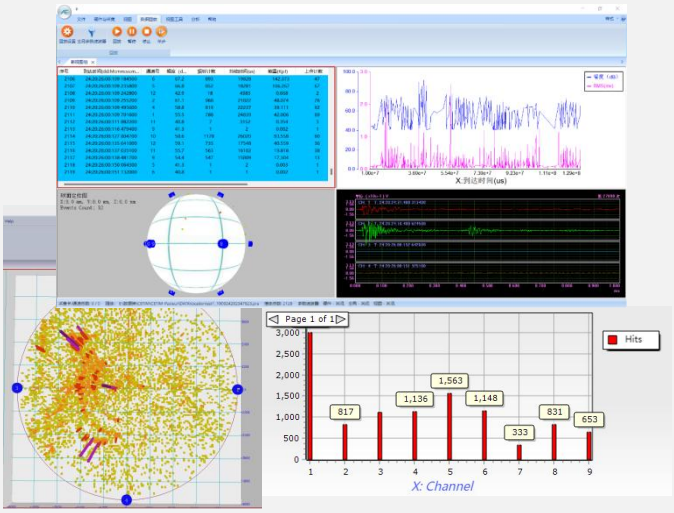
Technical Specification

Channel	Single channel
Sampling accuracy	16-bit
Trigger method	Threshold or time trigger
System noise	< 30dB
Sampling rate	Adjustable, max 2MS/s per channel
Dynamic range	70dB
Input bandwidth	10kHz-800kHz
Analog filter	High-pass filters: 30kHz, 125kHz; Low-pass filter: 80kHz, 175kHz. Hardware fixed at factory. Not adjustable after.
Digital filter	256th order FIR filter. Any value within 0kHz-1000kHz can be set as high-pass, low-pass or band-pass filters
Sensor	Integral sensors with built-in preamplifier (choose one of three preamp options when ordering: 40dB28V, 34dB12V or 26dB5V)
Data output	Waveform, AE parameters and parameter ratings
AE parameters	Arrival time, amplitude, counts, energy (power), rise time, rise counts, duration, RMS, ASL, peak frequency, centroid frequency, 5 partial power spectra segments
SD card	64G (can be expanded up to 512G)
Communication method	4G, Ethernet port, Wi-Fi, RS485
Working temperature	-20℃~60℃ (Wi-Fi version: 0℃~60℃)
Power supply	Power adaptor by default (12VDC) or battery connection optional
Weight	220g (without built-in battery and sensor)
Dimension	62mm x 100mm (D x H) (without built-in sensor and battery)
Installation	Magnetic base, which can be adsorbed on the metal surfaces

SWAE software

SWAE software is a professional and user friendly AE data display and analysis Windows desktop software. It is compatible with RAEM1, RAEM1-6 and SAEU3H series products.

- High degree of customization, various acquisition configuration and visualization of AE parameters and waveform
- Various 3D positioning diagram display, linear, planar, cube, cylinder, tank bottom, sphere location etc.
- FFT, wavelet, intensity and activity, clustering analysis etc.

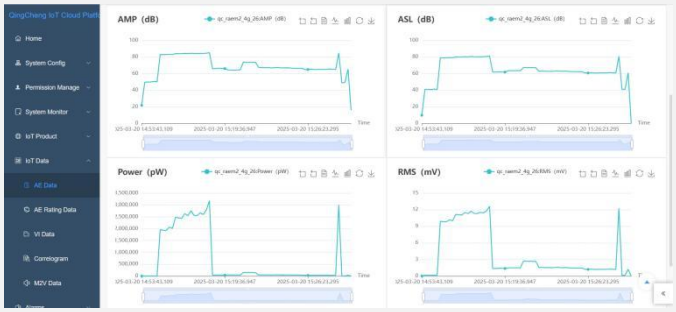


SWAE Screenshots

Qingcheng IoT Cloud

Qingcheng IoT Cloud platform is the cloud platform developed to store, display and analyse our IoT products. Customers can choose to rent and use our cloud platform for their IoT product data upload, display and analyse in real-time.

- Real-time visualization of AE parameters and waveform
- Remote configuration of the IoT products
- Historic data storage and download
- Data classification (rating) and alarm notification



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